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EXAMINER	
CLARK, GREGORY D	

ART UNIT	PAPER NUMBER
1794	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,857	OGURO, DAI	
	Examiner	Art Unit	
	GREGORY CLARK	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/04/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

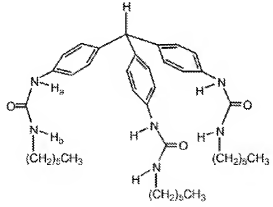
Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

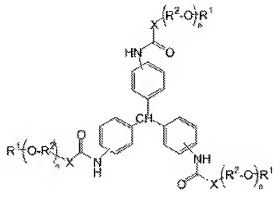
2. **Claims 1-3, 5, 7, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Fan (J. Supramolecular Chem. 2 (2002) p. 247-254).**

3. **Regarding Claims 1, 3, and 5**, Fan discloses a triphenylmethane derivative represented by Formula (2) shown below:



Formula 2

The applicant claims a triphenylmethane derivative represented by Formula (1) shown below:



Formula 1

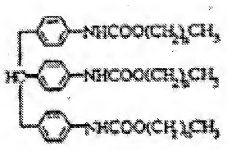
The applicant claims R1 for formula 1 is 1-5 carbon atoms (claim 4) and 6-10 carbon atoms (claim 5).

Formula (2) disclosed by Fan shows a triphenylmethane core with a urea-alkyl linkage (per claim 3) bonded to the each phenyl ring, X is NH, n is 0 (per claim 2), and R1 is 6 (per claims 4 and 5) carbon atoms which reads on the applicants' formula (1) (per claim 1).

Regarding Claims 7 and 10, the examiner takes the position that the term "gelling agent" is directed to how the material functions. It is the examiner's position that it functions in that capacity based on the structure of the compound which is the same.

4. **Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Smid (Tribology Transactions (1997), 40(2), 279-282).**

5. **Regarding Claims 1 and 7,** Smid discloses a triphenylmethane derivative represented by Formula (5) shown below:



Formula 5

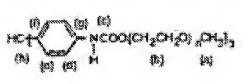
The applicant claims a triphenylmethane derivative represented by Formula (1) shown above. The applicant claims R1 for formula 1 is 1-5 carbon atoms (claim 4) and 6-10 carbon atoms.

Formula (5) disclosed by Smid shows a triphenylmethane core with a urethane linkage bonded to the each phenyl ring, X is O, n is 0 and R1 is as least 1.

6. **Regarding Claims 7**, the examiner takes the position that the term "gelling agent" is directed to how the material functions. It is the examiner's position that it functions in that capacity based on the structure of the compound which is the same.

7. **Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by** Chen, Langmuir (1996), 12(9), p. 2207-2213.

8. **Regarding Claims 1 and 7,** Chen discloses a triphenylmethane derivative represented by Formula (6) shown below:



Formula 6

The applicant claims a triphenylmethane derivative represented by Formula (1) shown above. The applicant claims R1 for formula 1 is 1-5 carbon atoms and 6-10 carbon atoms.

Formula (6) disclosed by Chen shows a triphenylmethane core with a urethane linkage bonded to the each phenyl ring, X is O, n is at least 1 (per claim 2), and R1 is 1.

9. **Regarding Claims 7**, the examiner takes the position that the term "gelling agent" is directed to how the material functions. It is the examiner's position that it functions in that capacity based on the structure of the compound which is the same.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. **Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fan (J. Supramolecular Chem. 2 (2002) p. 247-254) in view of Nonlinear dependence of the solubility of water in hydrocarbons on the molar volume of the hydrocarbon by Ruelle (J. Solution Chemistry Vol. 25, No. 7, 1996, p. 657-665).**

12. **Regarding Claims 6,** Fan discloses formula (2) and the applicant claims formula (1), both shown above. The applicant claims a R1 value of 11 to 20 carbons atoms and formula (2) disclosed by Fan shows a value of 6 carbon atoms in the R1 position.

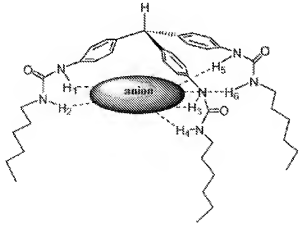
Fan discloses a single value of 6 carbons, but this is merely an example.

R1 materials having different lengths are homologs. The effect here is that the longer the carbon chain the more hydrophobic the structure will be as alkane groups are hydrophobic and the longer one makes them the more hydrophobic they are going to be; this increases the percentage of hydrophobic material in the overall compound. This is a fundamental understanding in organic chemistry. Ruelle shows how the solubility of different alkanes decreases as the chain length increases (see table 1). Given that the effect of the length of a hydrocarbon chain is well understood as it relates to the hydrophobic nature of the material, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have optimized the length of the carbon chain in the structure of Fan depending on the effect desired for a given application.

In terms of synthesis, the examiner takes the position that the difference in the length of the alkyl group attacked to the urea linkage is an obvious variant that one of ordinary skill in the art at the time of the invention could achieve through routine synthetic methods. A synthetic organic chemist would make a series of compounds with varying length for the alkyl groups which would include the range claimed by the applicant. Therefore formula (1) claimed by the applicant would have been obvious with respect to formula (2) disclosed by Fan.

13. **Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fan (J. Supramolecular Chem. 2 (2002) p. 247-254)) in view of Garner (5688440).**

Regarding Claims 7-8, 10-12, Fan teaches shows in formula (3) that triphenylmethaneurea based compounds can engage in hydrogen bonding with organic materials (see below). Fan fails to mention Formula (2) type materials as gelling agents.



Formula (3)

The examiner takes the position that materials that contain urea linkages are known in the art to engage in hydrogen bonding and hydrogen bonding is known to cause gelation (see Garner column 1, lines 1-10), thickening or hardening of organic solutions or mediums. Formula (3) disclosed by Fan show how the triphenylmethaneurea derivative can engage in hydrogen bonding with a polar species. The manner in which triphenylmethaneurea derivative engages in hydrogen bonding with the polar anion species disclosed by Fan would be the same manner in which an organic solvent or medium would ultimately be engaged that would result in gelation due the hydrogen bonding. The usage of such materials as gelling agents would have been obvious to one of ordinary skill in the art at the time of the invention (per claims 7, 10 and 11).

With the expectation of success, a person of ordinary skill in the art at the time of the invention would through routine experimentation apply varying levels of the triphenylmethaneurea derivative to a suitable organic medium to form a gel (per claim 8).

The examiner takes the position that that it is common in the art combine organic gels with organic fibers to increase the durability of gel by creating a reinforcing interpenetrating network between the gel and the fiber. Merrill teaches that the fibrous material must readily permit the gel network to form around it, thereby producing a substantially stronger gel as a result. Merrill also discloses examples of fiber materials such as nylon, rayon, and hydrocarbon fibers (column 4, lines 14-25). Thinner fibers are preferred over thicker fibers since better results are obtained through use of a

greater number of small diameter fibers than a lesser number of large diameter fibers (column 4, lines 45-48).

The applicant claims an organic fiber diameter of 500nm or less. Fan fails to teach an organic fiber diameter. Through routine experimentation a person of ordinary skill in the art at the time of the invention would adjust the organic fiber diameter which will directly affect the strengthening of the organic gel. In order to optimize the strengthening of the organic fiber a range of diameters would be selected that would include the range claimed by the applicant. (per claims 9 and 12).

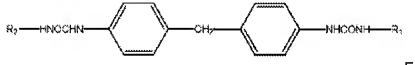
14. **Claims 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fan (J. Supramolecular Chem. 2 (2002) p. 247-254)) in view of Garner (5688440) and in view of Merrill (5,377,760).**

15. **Regarding Claim 9 and 12,** Fan teaches shows in formula (3) that triphenylmethaneurea based compounds can engage in hydrogen bonding with organic materials. Garner discloses how hydrogen bonding is used in the formation of an organic gel (column 1, lines 1-9). The applicant claims an organic fiber diameter of 500nm or less. Fan fails to teach an organic fiber diameter.

The examiner takes the position that it is well know in the art that the properties of a given fiber can be enhanced or reinforcement by the addition of a gel. It would have been obvious at the time of the invention by a person of ordinary skill in the art to strengthen an organic fiber by adding an organic gel (see Merrill, abstract).

16. **Claims 1-8 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kyodo (JP2003-064346) in view of Fan (J. Supramolecular Chem. 2 (2002) p. 247-254) and in view of Garner (5688440).**

17. **Regarding Claim 1-6,** Kyodo discloses a diphenylmethaneurea derivative represented by formula (4) shown below:



Formula 4

In the above formula, R1 is a linear or branched alkyl chain 1-40 (per claims 1, 4-6), n is 0 (per claim 2), show a urea linkage (per claim 3), the urea functional groups would be the active groups of the molecule.

Formula (4) differs from formula (1) claimed by the applicant in that there are only two phenylurea groups bonded to the central methane core.

The examiner takes the position that formula (1) claimed by the applicant is an obvious variant of formula (4) disclosed by Kyodo since achieving a tri-substituted methane versus a di-substituted methane is well within the scope of routine organic synthesis. A synthetic organic chemist would make a variety of materials by varying the degree of substitution around the methane core which would include the tri-substituted triphenylmethaneurea derivatives claimed by the applicant. The reason to include a sample with a third urea linkage would have been to improve the gelling capacity of the

agent by increasing the hydrogen bonding character of the material (see Garner, column 1, lines 1-9).

Additionally, Fan discloses that such triphenylmethaneurea derivatives (see formula 2 above) engage in hydrogen bonding and were known in the art at the time of the invention.

18. **Regarding Claims 7, 10 and 11**, Kyodo discloses that diurea compound (formula 4) is an outstanding gelling agent in various organic fluids (paragraph 5) (per claim 7, 10-11).

19. **Regarding Claims 8,** Kyodo discloses that di-phenylmethaneurea compounds can be used as gelling agents.

With the expectation of success, a person of ordinary skill in the art through routine experimentation would apply varying levels of the di-phenylmethaneurea derivative to a suitable organic medium to form a gel.

20. **Claim 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kyodo (JP2003-064346) in view of Fan (J. Supramolecular Chem. 2 (2002) p. 247-254) and in view of Garner (5688440) in view of Merrill (5,377,760).**

21. **Regarding Claims 9 and 12,** Kyodo discloses that diurea compound (formula 4) is an outstanding gelling agent in various organic fluids (paragraph 5). Fan teaches in

formula (3) that triphenylmethaneurea based compounds can engage in hydrogen bonding with organic materials. Garner discloses how hydrogen bonding is used in the formation of an organic gel (column 1, lines 1-9). The applicant claims an organic fiber diameter of 500nm or less. Kyodo fails to teach an organic fiber diameter.

The examiner takes the position that it is well know in the art that the properties of a given fiber can be enhanced or reinforcement by the addition of a gel. It would have been obvious at the time invention by a person of ordinary skill in the art to strengthen an organic fiber by adding an organic gel (see Merrill, abstract).

Through routine experimentation a person of ordinary skill in the art would adjust the level of organic gel added to the fiber to control the degree of swelling of the fiber which ultimately would give a diameter range for the fiber that would include the range claimed by the applicant (per claims 9 and 12).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY CLARK whose telephone number is (571)270-7087. The examiner can normally be reached on M-Th 7:00 AM to 5 PM Alternating Fri 7:30 AM to 4 PM and Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1794

GREGORY CLARK /GDC/
Examiner
Art Unit 1794